

**ABSTRACT**

The invention relates to a method of forming a trench filled with a thermally conducting material in a semiconductor substrate. In one embodiment, the method includes filling a portion of the trench with a thermally conducting material and patterning a contact to the thermally conducting material. The invention also relates to a semiconductor device. In one embodiment, the semiconductor device has a trench defining a cell region, wherein a portion of the trench includes a thermally conducting material, and a contact to the thermally conducting material. The invention further relates to a semiconductor device and a method of forming a semiconductor device with an interlayer dielectric that is a thermally conducting material.